

What is claimed is:

1 1. A computer-implemented method of debugging an object-oriented
2 computer program, the method comprising:
3 (a) in response to user input, setting an inheritance breakpoint that is
4 associated with a first program entity in the object-oriented computer program
5 in which is identified a method; and
6 (b) halting execution of the object-oriented computer program during
7 debugging in response to reaching an implementation of the method defined in
8 a second program entity in the object-oriented computer program that is
9 different from the first program entity.

1 2. The computer-implemented method of claim 1, wherein the first program
2 entity is an interface that identifies the method, and wherein the second program entity
3 is a class that implements the method.

1 3. The computer-implemented method of claim 1, wherein the first program
2 entity is a first class that includes a second implementation of the method, wherein the
3 second program entity is a second class that inherits from the first class, and wherein
4 the first implementation of the method in the second class overrides the second
5 implementation of the method in the first class.

1 4. The computer-implemented method of claim 3, wherein the second class is
2 a subclass of the first class.

1 5. The computer-implemented method of claim 1, wherein the first program
2 entity is an abstract class that identifies the method, and wherein the second program
3 entity is a non-abstract class that implements the method.

1 6. The computer-implemented method of claim 1, wherein the inheritance
2 breakpoint is additionally associated with the method.

1 7. The computer-implemented method of claim 6, wherein setting the
2 inheritance breakpoint includes storing in a breakpoint data structure an entry that
3 identifies the first program entity and the method.

1 8. The computer-implemented method of claim 1, further comprising, during
2 loading of a class in the object-oriented computer program, identifying each
3 implementation of the method in the class and setting a breakpoint on such
4 implementation, wherein halting execution of the object-oriented computer program
5 during debugging in response to reaching the implementation of the method includes
6 reaching a breakpoint set on such implementation.

1 9. The computer-implemented method of claim 1, further comprising setting a
2 breakpoint on each implementation of the method, wherein halting execution of the
3 object-oriented computer program during debugging in response to reaching the
4 implementation of the method includes reaching a breakpoint set on such
5 implementation.

1 10. The computer-implemented method of claim 9, wherein setting a
2 breakpoint on each implementation of the method includes setting a breakpoint on a
3 first statement in an implementation of the method.

1 11. The computer-implemented method of claim 9, wherein setting a
2 breakpoint on each implementation of the method includes setting a breakpoint on a
3 method call to an implementation of the method.

1 12. The computer-implemented method of claim 1, wherein setting the
2 inheritance breakpoint includes associating a user-specified condition with the
3 inheritance breakpoint, and wherein halting execution of the object-oriented computer
4 program during debugging in response to reaching the implementation of the method
5 is performed only if the user-specified condition has been met.

1 13. A computer-implemented method of debugging an object-oriented
2 computer program, the method comprising:

3 (a) in response to user input, setting an inheritance breakpoint that is
4 associated with a first class in the object-oriented computer program in which
5 is identified a method; and

6 (b) halting execution of the object-oriented computer program during
7 debugging in response to reaching an implementation of the method defined in
8 a second class in the object-oriented computer program that inherits from the
9 first class.

- 1 14. A computer-implemented method of debugging an object-oriented
- 2 computer program, the method comprising:
- 3 (a) in response to user input, setting an inheritance breakpoint that is
- 4 associated with an interface in the object-oriented computer program in which
- 5 is identified a method; and
- 6 (b) halting execution of the object-oriented computer program during
- 7 debugging in response to reaching an implementation of the method defined in
- 8 a class in the object-oriented computer program that implements the interface.

1 15. A computer-implemented method of debugging an object-oriented
2 computer program, the method comprising:
3 (a) receiving user input to halt program execution during debugging in
4 response to reaching any of a plurality of implementations of a method in an
5 object-oriented computer program; and
6 (b) thereafter setting a breakpoint for at least a subset of the plurality
7 of implementations such that execution of the object-oriented computer
8 program will be halted in response to reaching any of the implementations on
9 which a breakpoint has been set.

1 16. The computer-implemented method of claim 15, wherein the user input to
2 halt program execution includes user input to set an inheritance breakpoint on the
3 method.

1 17. The computer-implemented method of claim 15, wherein setting the
2 breakpoint includes, during loading of a class in the object-oriented computer
3 program, identifying each implementation of the method in the class and setting a
4 breakpoint on such implementation.

1 18. An apparatus, comprising:

2 (a) a memory within which is resident at least a portion of an object-
3 oriented computer program under debug, the object-oriented computer
4 program including a first program entity in which is identified a method, and a
5 second program entity that is different from the first program entity, and that
6 includes an implementation of the method; and

7 (b) program code configured to set an inheritance breakpoint that is
8 associated with the first program entity in response to user input, and to halt
9 execution of the object-oriented computer program during debugging in
10 response to reaching the implementation of the method defined in the second
11 program entity.

1 19. The apparatus of claim 18, wherein the first program entity is an interface
2 that identifies the method, and wherein the second program entity is a class that
3 implements the method.

1 20. The apparatus of claim 18, wherein the first program entity is a first class
2 that includes a second implementation of the method, wherein the second program
3 entity is a second class that inherits from the first class, and wherein the first
4 implementation of the method in the second class overrides the second
5 implementation of the method in the first class.

1 21. The apparatus of claim 18, wherein the first program entity is an abstract
2 class that identifies the method, and wherein the second program entity is a non-
3 abstract class that implements the method.

1 22. The apparatus of claim 18, wherein the inheritance breakpoint is
2 additionally associated with the method, and wherein the program code is configured
3 to store in a breakpoint data structure an entry that identifies the first program entity
4 and the method.

1 23. The apparatus of claim 18, wherein the program code is further configured
2 to set a breakpoint on each implementation of the method, and wherein the program
3 code is configured to halt execution of the object-oriented computer program during
4 debugging in response to reaching a breakpoint set on such implementation.

1 24. The apparatus of claim 23, wherein the program code is configured to set
2 the breakpoint on each implementation of the method by dynamically setting a
3 breakpoint on each implementation of the method in a class in the object-oriented
4 computer program during loading of the class.

1 25. The apparatus of claim 18, wherein the program code is configured to
2 associate a user-specified condition with the inheritance breakpoint, and wherein the
3 program code is configured to halt execution of the object-oriented computer program
4 during debugging in response to reaching the implementation of the method only if
5 the user-specified condition has been met.

1 26. An apparatus, comprising:

2 (a) a memory within which is resident at least a portion of an object-
3 oriented computer program under debug, the object-oriented computer
4 program including a method and a plurality of implementations of the method;
5 and

6 (b) program code configured to receive user input to halt program
7 execution during debugging in response to reaching any of the plurality of
8 implementations of the method, and to thereafter set a breakpoint for at least a
9 subset of the plurality of implementations such that execution of the object-
10 oriented computer program will be halted in response to reaching any of the
11 implementations on which a breakpoint has been set.

1 27. The apparatus of claim 26, wherein the user input to halt program
2 execution includes user input to set an inheritance breakpoint on the method, and
3 wherein the program code is configured to set a breakpoint by, during loading of a
4 class in the object-oriented computer program, identifying each implementation of the
5 method in the class and setting a breakpoint on such implementation.

- 1 28. A program product, comprising:
- 2 (a) program code configured to set an inheritance breakpoint in
- 3 response to user input, wherein the inheritance breakpoint is associated with a
- 4 first program entity in an object-oriented computer program in which is
- 5 identified a method, and to halt execution of the object-oriented computer
- 6 program during debugging in response to reaching an implementation of the
- 7 method defined in a second program entity in the object-oriented computer
- 8 program that is different from the first program entity; and
- 9 (b) a signal bearing medium bearing the program code.

- 1 29. The program product of claim 28, wherein the signal bearing medium
- 2 includes at least one of a transmission medium and a recordable medium.

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